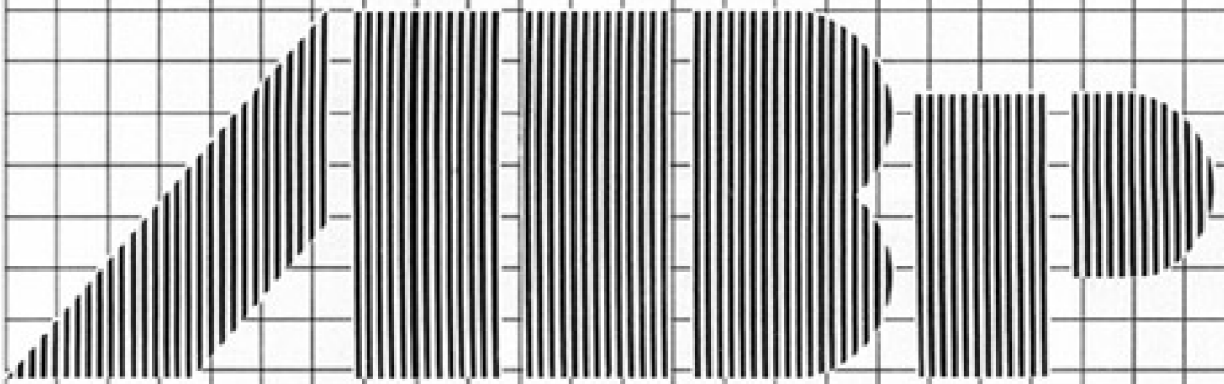
Technics

R&B series

Operating instructions

System Tonearm EPA-500

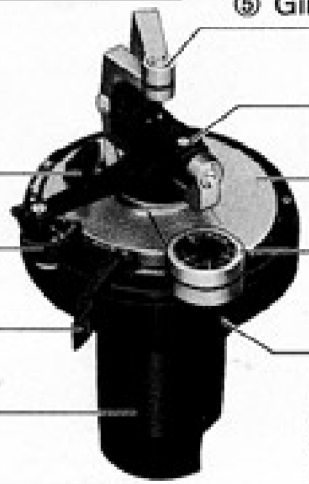
Arm Base (EPA-B500)
Arm Unit (EPA-A501H)
Stylus Pressure Gauge (SH-50P1)



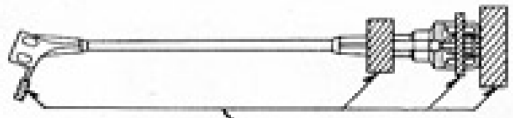
- Interchangeable arm units for optimum resonance frequency of the tonearm and cartridge combination
- Titanium nitride tapered pipe arm
- Dynamic damping system
- Gimbal suspension arm base for various arm units
- Minimum bearing friction of 7mg in all directions
- Helicoid height adjustment ranging up to 20mm
- Precise electronic stylus pressure gauge

Parts identification

Arm base/EPA-B500

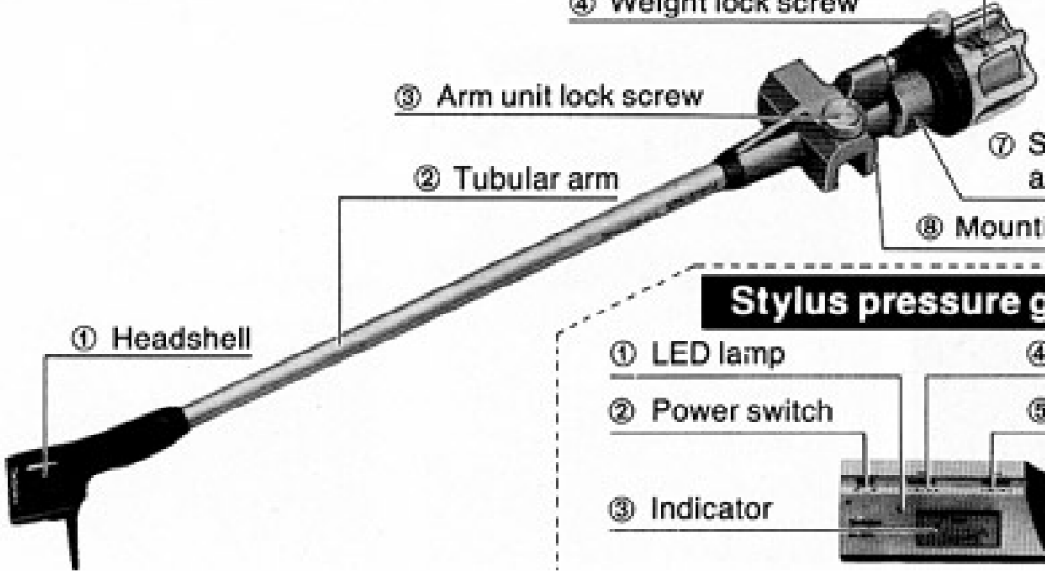


① Arm lift
② Arm clamp
③ Cueing lever
④ Arm stand
⑤ Gimbal suspension pivots (four pivots)
⑥ Arm unit mounting portion
⑦ Base unit
⑧ Anti-skating control knob
⑨ Arm height adjustment ring



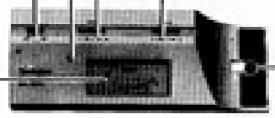
⑥ Spacers
(Used for transporting; remove before use.)

Arm unit/EPA-A501H



⑤ Dynamic damping weight
④ Weight lock screw
③ Arm unit lock screw
② Tubular arm
① Headshell
⑦ Stylus pressure adjustment ring
⑧ Mounting portion

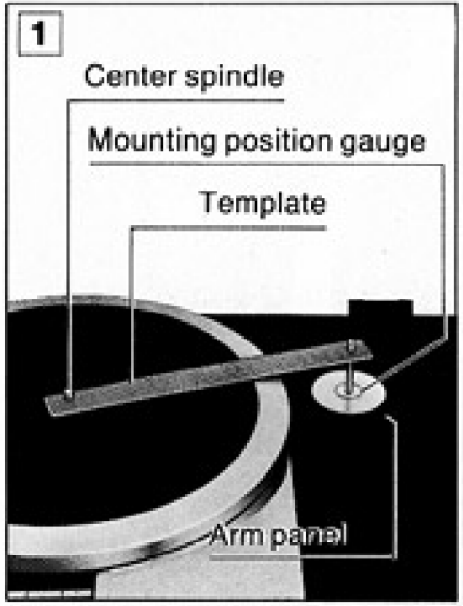
Stylus pressure gauge/SH-50P1



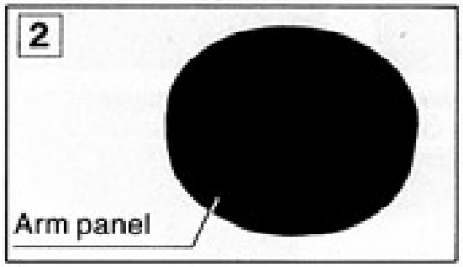
① LED lamp
② Power switch
③ Indicator
④ Zero adjustment knob
⑤ Gain adjustment knob
⑥ Stylus tip set position

Assembly and adjustments

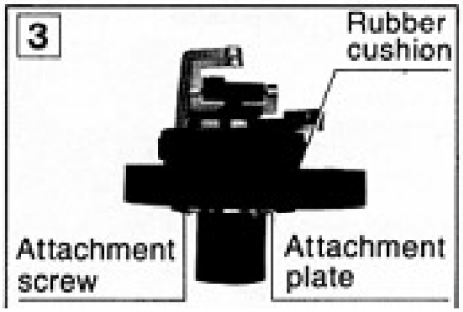
1



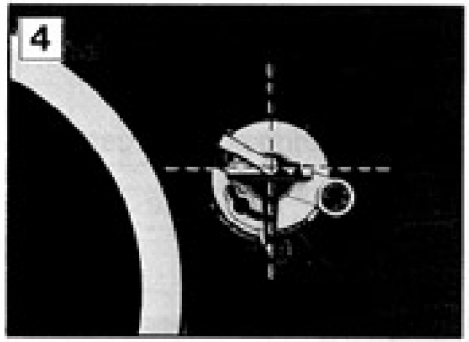
2

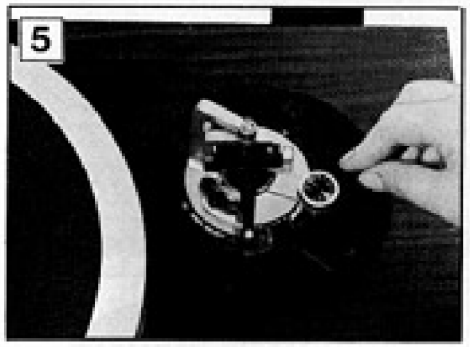


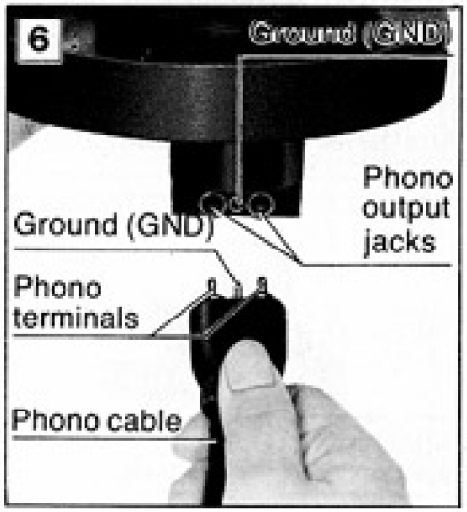
3

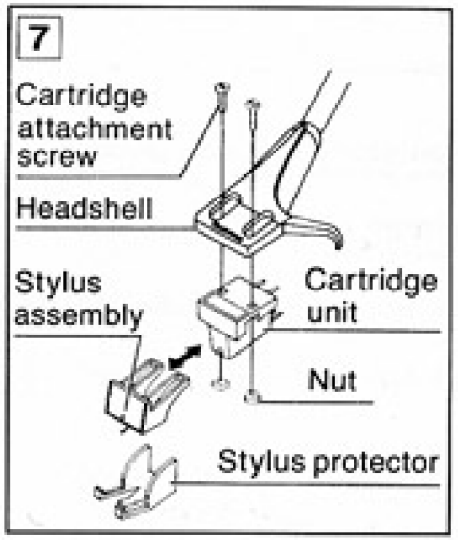


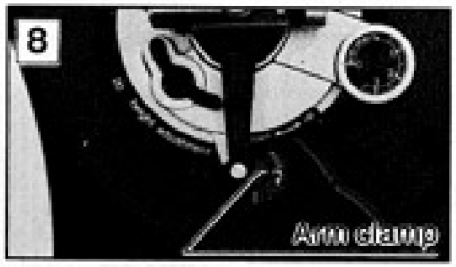
Assembly and adjustments

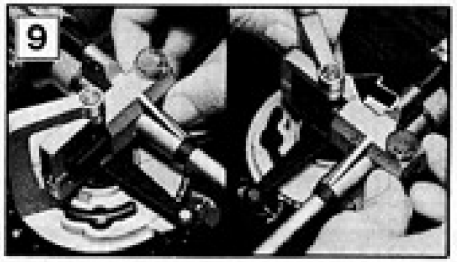


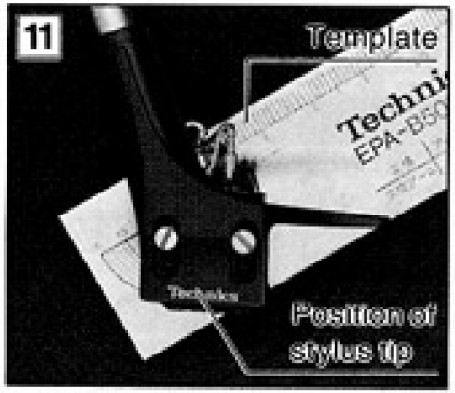


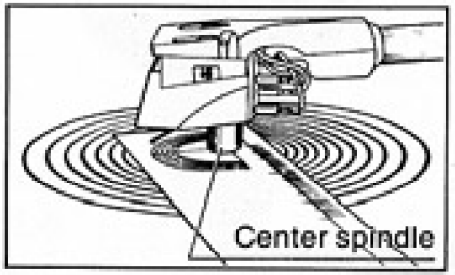


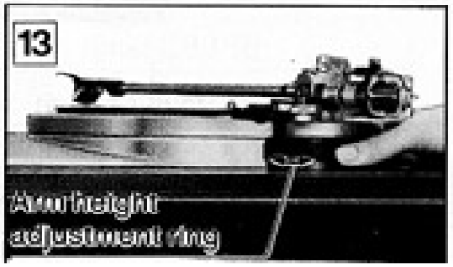


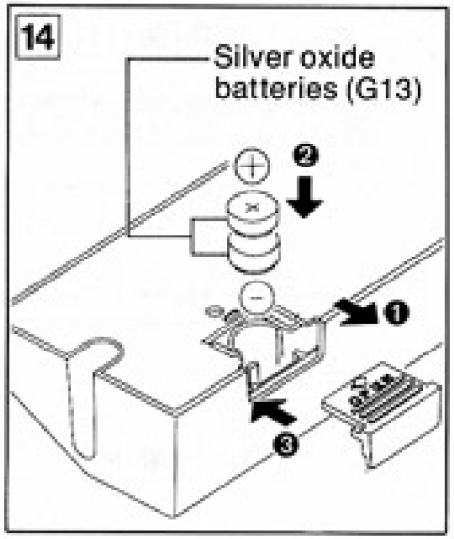


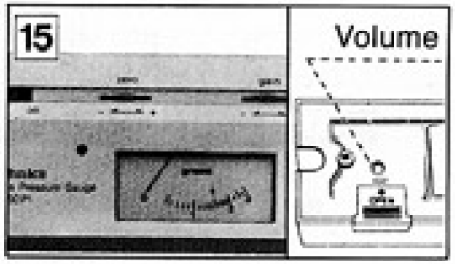


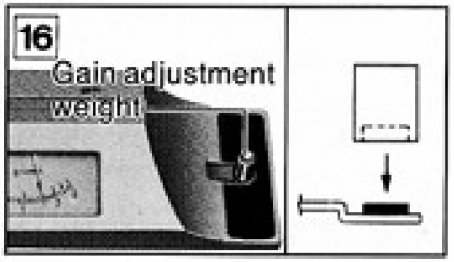


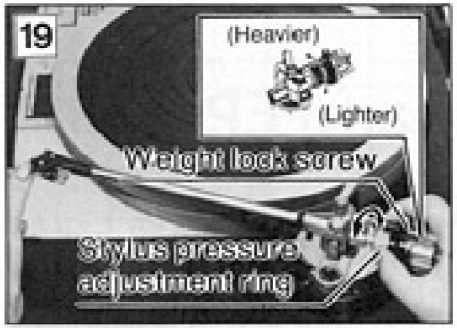


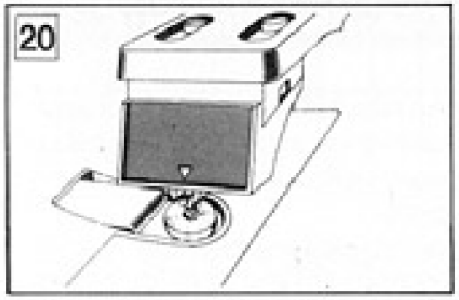


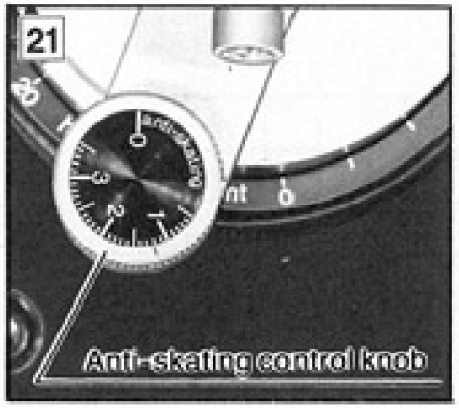


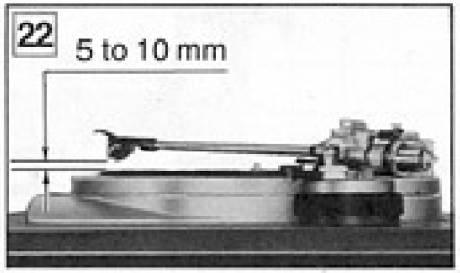


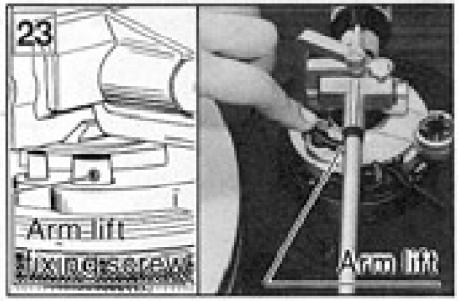




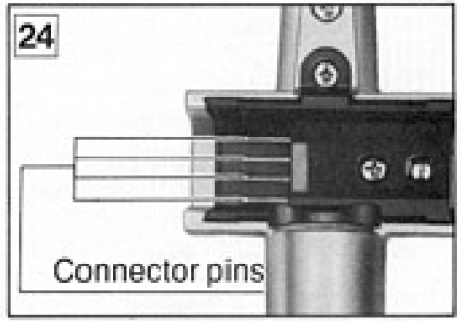


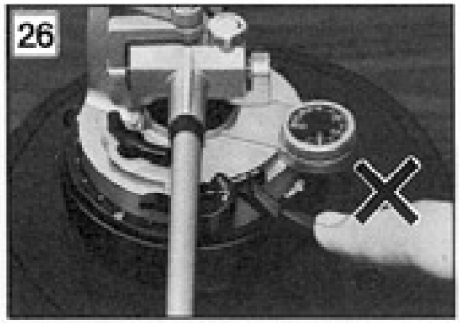




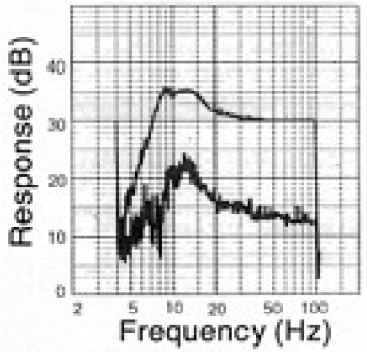


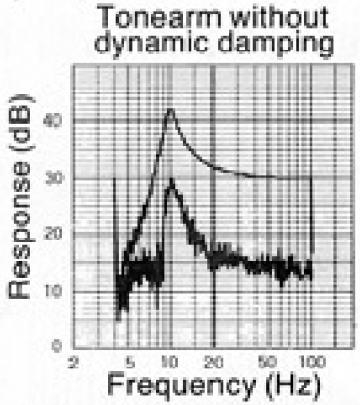
Points to note:





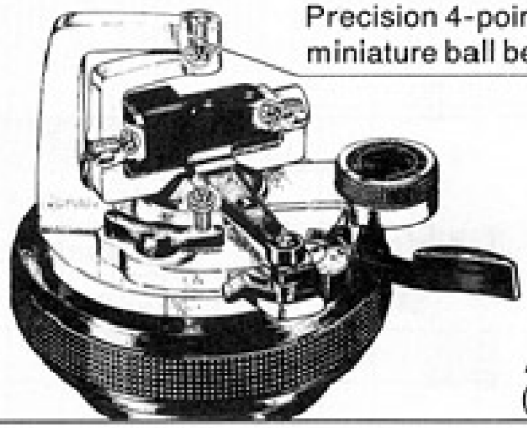
Dynamic damping effect
(comparison of low-range frequency response)





Test record: XG-7001
Cartridge: Technics EPC-305MC
Stylus pressure: 1.25 g
Turntable: Technics SP-15

Structure of gimbal-suspension



Thank you very much for your purchase of this model EPA-500 Technics System Tonearm.

This model differs from previous universal tonearm designs by its ability to adapt various types of arm units to the arm base (EPA-B500). This can be likened to a camera; the arm base being the body and the arm units being the interchangeable lenses. The EPA-500 comes as a standard system, but the optional arm units* can be employed in accordance to the compliance and mass characteristics of your cartridge, and changed as easily as you would change the headshell. When making changes, please also refer to the instruction manual provided with the arm units. Also, a stylus pressure gauge (SH-50P1) is provided with the standard system. This instruction manual also applies to the EPA-B500 arm base.

***Note:**
Please refer to the arm unit/cartridge matching list.

Contents

Parts identification 1
- Checklist of parts 5

Assembly and adjustments ..... 5~9
- Establishment of arm base position 5
- Installation of arm base 5
- Attachment of cartridge ..... 5~6
- Concerning the arm clamp 6
- Installation of arm unit 6
- Adjustment of overhang 6
- Adjustment of arm height ..... 6~7
- How to use the stylus pressure gauge ..... 7~8
  - Power source 7
  - Battery insertion 7
  - Adjustment of the stylus pressure gauge 7
  - Setting the stylus pressure 8
- Caution when inserting batteries 8
- Battery life 8
- Adjustment of anti-skating 9
- Adjustment of arm-lift height 9
- Connection of phono cable 9

Points to note 9

Specifications of EPA-500 standard system 10
- Arm base EPA-B500 10
- Arm unit EPA-A501H 10
- Stylus pressure gauge SH-50P1 10
- Concerning the Technics System Tonearm 11

Features of the Technics EPA-500 ..... 11~12
- Dimensional diagram

■ Checklist of parts

Arm base EPA-B500

Arm base unit 1
Rubber cushion 1
Attachment plate 1
Phono cable 1
Template 1
Mounting position gauge 1
Driver 2

Attachment screws	Dimensions	Number	Proper base thickness	Technics turntable base
	M4×16	3	12.5~18.5 mm	
	M4×20	3	16.5~22.5 mm	SH-15B1
	M4×25	3	21.5~27.5 mm	SH-10B3

Arm unit EPA-A501H

Arm unit 1
Screw for cartridge 4
Nut for cartridge 6
Shell weight 1

Stylus pressure gauge SH-50P1

Stylus pressure gauge 1
Protector for stylus tip set position 1
Gain adjustment weight 1
Battery (G13) 2

Assembly and adjustments

■ Establishment of arm-base position

1. Set the template provided on the center spindle of the platter, and use the mounting position gauge to establish a suitable position on the arm panel (a point where the rear portion of the arm unit will not make contact with the dust cover during play), and inscribe a circle around the mounting position gauge with a pencil. **(See Fig. 1.)**
2. Remove the arm panel from the turntable base.
3. Use a drill to make a hole corresponding to the above-mentioned circle, and smooth away any unnecessary parts using a file. **(See Fig. 2.)**

■ Installation of arm base

1. Lay down the rubber cushion and attach the arm base unit to the arm panel, using the screws and plate provided to fix it from underneath. **(See Fig. 3.)** At this time, confirm that the direction of the arm base is straight, and then use a plus (Philips-head) driver to tighten it. **(See Fig. 4.)**
2. Secure the arm panel to the turntable base by tightening the 4 hexagonal screws. **(See Fig. 5.)**
3. Connect the phono cable provided to the phono output jacks on the arm base. (The small pin in the center is the ground.) **(See Fig. 6.)**

■ Attachment of cartridge (See Fig. 7.)

Note:
These instructions are made according to procedures for attachment of a Technics EPC-205C type cartridge.
If another cartridge is to be utilized, please attach it in accordance with the cartridge's own instruction manual.

1. Connect the lead wires to the cartridge. The cartridge terminals are differentiated by color, and the leads should be connected accordingly.
   Red→(R)+(right channel+terminal)
   Green→(R)−(right channel ground terminal)
   White→(L)+(left channel+terminal)
   Blue→(L)−(left channel ground terminal)
2. Use the screws and nuts provided with the cartridge or arm unit to secure the cartridge to the headshell. After this, adjust the overhang. (Refer to the section on **"Adjustment of overhang"**.)

Note:

To prevent damage to the stylus assembly, it is recommended that it be removed from the cartridge during installation.

If the cartridge being used has a lighter side value within the appropriate cartridge weight range and is to be used under a heavy side stylus pressure within the specified stylus pressure range, attach the headshell weight between the headshell and cartridge main body.

■ Concerning the arm clamp (See Fig. 8.)

An arm clamp is employed to lock the rotating section of the gimbal suspension in place. When installing the arm unit or when not using the turntable, lock the tonearm suspension with the clamp.

If the arm clamp is not locked, the pivots will move and if the arm unit has been installed, this might result in damage to the stylus.

■ Installation of the arm unit (See Figs. 9, 10.)

Align the mounting section of the arm unit with that of the arm base, and while sliding it in the direction of the arrow, insert it until it arrives at the fixed position and stops. Then secure it with the arm-unit lock screw.

Note:

- When installing or removing the arm unit, be sure to turn the amplifier's volume control to "0" or turn off the amplifier's power before loosening the arm unit locking screw.
- Please be certain to use the arm unit only when it is locked into position. If not sufficiently tightened, a humming noise will be produced.

■ Adjustment of overhang (See Fig. 11.)

The overhang on this unit should be 15 mm.

Place the template over the center spindle and align the stylus position with a 15 mm line. Then secure the cartridge in that position. Refer to **"Attachment of cartridge"** section of the text.

Note:

- Please take care not to injure the stylus tip.
- Depending on the cabinet you use, there may be cases where the stylus pressure adjustment ring comes into contact with the anti-skating control knob when the tonearm unit is moved in the direction of the center spindle. In such a case, loosen the weight lock screw and turn the stylus pressure adjustment ring clockwise for displacement rearwards.

■ Adjustment of arm height (See Figs. 12, 13.)

On this unit, the height of the arm can be varied up to 20 mm by rotating the adjustment ring. The height is indicated in 1 mm increments by the scale.

Note:

During shipment of the arm unit stylus pressure adjustment ring is fixed at the extreme forward position. Loosen the weight lock screw by rotating it counterclockwise, turn the stylus pressure adjustment ring in a clockwise direction (which makes the stylus pressure lighter), and turn to the zero balance position. Then, turning the adjustment ring 1 full rotation to change the pressure by about 0.5 gram, set the stylus pressure to the value recommended for the cartridge in use.

For cartridges with a heavy weight, turn the stylus pressure adjustment ring up to the rearmost position.

1. Place a record on the turntable and without rotating the platter, gently lower the stylus onto the record.
2. Rotate the arm height adjustment ring until the arm unit appears parallel to the record. **(See Fig. 13.)**

Note:

- Take care not to touch the arm unit at this time. If the arm unit moves, this can result in damage to the stylus.

■ How to use the stylus pressure gauge (SH-50P1)

■ Power source

This unit is driven by 2 silver oxide SR44 type batteries. Before inserting the National G13 batteries provided, please read the **"Caution when inserting batteries"** section thoroughly and insert them properly.

Please refer to the "Chart of Silver Oxide Battery Types" for information concerning batteries in various areas.

Brand	**National**	Eveready	Ray-O-Vac	Mallory	VARTA
Number	**G13**	S76	RS76	MS76	7301

■ Battery insertion

1. Push the battery compartment cover in the direction of "OPEN" **(See Fig. 14-❶.)**
2. Confirm that the 2 silver oxide batteries' [+] and [−] polarities are properly aligned and insert them. Then replace the cover. **(See Fig. 14-❷.14-❸.)**

■ Adjustment of stylus pressure gauge

In order to obtain precise measurement, each time you use the gauge make adjustments following the procedure shown below:

1. Turn the power switch to [on]. The LED lamp will light up.
2. Turn the zero adjustment knob towards [+] or [−] until the needle indicates [0]. **(See Fig. 15.)**
3. Place the recessed part of the provided gain adjustment weight on the protruding part of the stylus set plate and turn the gain adjustment knob towards [+] or [−] until the needle indicates [▼]. **(See Fig. 16.)**

Note:

Should the needle not indicate [0] even when the zero adjustment knob is rotated, adjust by rotating the zero adjustment knob and the gain adjustment knob fully towards the [+] side, and turn the volume control (Fig. 15) at the bottom portion of the stylus pressure gauge either clockwise or counterclockwise by a screwdriver to bring the needle between [2.5] and [3].

Subsequently, make zero adjustment according to the procedure in item 2.

Note:

- The stylus pressure gauge should never be placed on the surface of a record.
- When making adjustments using the gauge, wait about 10 seconds after switching the unit on. Also, several seconds are required for the needle to return to the [0] position, but this is caused by a temperature compensation mechanism and is not due to any fault in the performance.
- Do not move the gain control until the zero adjustment has been completed, and do not perform the operations in reverse.
- After use, be sure to switch off the power to prevent unnecessary battery consumption.

  Forgetting to switch off the power will wear out the batteries in about 10 hours, thus making it impossible to use the gauge.

■ Setting the stylus pressure

The stylus pressure gauge is grooved on its side in order to be used in a stable position on the platter. Secure it by placing it on the center spindle. **(See Fig. 17.)**

Note:

If the center spindle of the turntable in use is long, or if any other part except the stylus comes into contact with the stylus pressure gauge, move it slightly away from the spindle. Also, smoother adjustment can be performed if the turntable platter is prevented from rotating.

1. Loosen the weight lock screw by turning it in a counterclockwise direction.
2. Free the arm from the arm clamp and let the stylus tip rest upon the indented center part of the stylus plate. Read the stylus pressure. **(See Figs. 18, 20.)**
3. Then turn the stylus pressure ring in a clockwise direction (the pressure will become lighter) or counterclockwise (pressure will become heavier), and adjust to the proper stylus pressure. **(See Fig. 19.)**
4. After adjustment, secure the weight lock screw.

Note:

- When turning the stylus pressure adjustment ring be sure to remove the stylus from the gauge before performing adjustments. **(See Fig. 19.)** Also, take care not to injure the stylus tip during this operation.
- After use of the stylus pressure gauge, do not forget to turn the power switch to [off] to prevent battery waste.

■ Caution when inserting batteries

Mishandling of batteries can result in leakage or damage.
Please be certain to observe the following:

1. When the batteries become weak, replace all of them; do not attempt to mix old and new batteries.
2. Do not combine different types of batteries together. For example: although they appear interchangeable because they are the same size, mercury batteries (MR44) and silver oxide batteries (SR44) have different voltage. Also, do not attempt to mix batteries of different brands. This is not only uneconomical, but the unit will not be able to display its performance to the full.
3. After use, be certain to return the unit's power switch to the [off] position. Also, when not utilizing for prolonged periods, remove the batteries from their compartment and store them.
4. Remove worn out batteries and dispose of them promptly.
5. Do not attempt to recharge batteries, or short-circuit, break open, heat or throw into a fire.
6. When changing the batteries, confirm that their contact surfaces, as well as the terminals of the stylus pressure gauge, are clean and uniformly shaped.
   At this time, be sure that the batteries are inserted according to the [+] and [−] indications.

■ Battery life

When the batteries become worn down, the indicator needle will not reach the [▼] point when the gain control knob is turned to [+]. In some cases the LED lamp will light, but the unit will not be effective for stylus pressure measurement. Therefore, replace the batteries. Refer to the section on **"Adjustment of stylus pressure gauge"**.

The life of the batteries during consecutive use is about 10 hours. (National silver oxide G13 batteries used at 20°C.)

Note:

Ordinarily, battery life becomes shorter when used at low temperatures (below around 5°C.). Also, they do not function well in high humidity. Therefore, store them in a dry place with few temperature changes.

■ Adjustment of anti-skating (See Fig. 21.)

After adjusting the stylus pressure, turn the anti-skating control knob to the same value as the stylus pressure setting.

■ Adjustment of arm-lift height (See Figs. 22, 23.)

The proper height of the arm lift (the distance of the stylus tip from the disc with the cueing lever in the [up] position) is about 5 to 10 mm. If adjustment becomes necessary, follow the procedure below:

1. Set the cueing lever to the [up] position.
2. Slightly loosen the arm-lift fixing screw, and raise or lower the arm lift. If the arm lift is raised by about 1 mm, the stylus will be raised by about ten times that amount, or about 10 mm.
3. Then, secure the arm lift with the arm-lift fixing screw.

■ Connection of phono cable

After all adjustments have been completed, connect the phono cable to the phono input terminals on the amplifier or receiver.

Phono Terminals	**Amplifier/Receiver**
White (L)→	Phono L input terminal
Red (R)→	Phono R input terminal
Black (ground wire)→	GND terminal

Note:
Be certain to connect the ground wire. Without this connection, a hum will be produced from the amplifier or receiver.

Points to note:

- Do not twist or pull the arm unit's connector pins or the connector on the arm base, or otherwise alter their shapes, as this could lead to misconnection. **(See Figs. 24, 25.)** Take special caution when installing or removing the arm unit.
- Do not depress or raise the cueing lever. Use it by sliding it to the right or left. **(See Fig. 26.)**
- Please be sure to use the tonearm in a horizontal position.
- Do not push in the arm lift when the fixing screw has been secured. **(Refer to Fig. 23.)**

Specifications (EPA-500 standard system)

Arm base EPA-B500 (Patent pending)

Type:	Arm base with arm unit interchangeability
Pivot construction:	Gimbal suspension type
Arm height range:	Min.42 mm~max. 62 mm (from the surface of the base to the arm pipe) (Helicoid portion 20 mm)
Friction:	Under 7 mg (lateral, vertical)
DC resistance of phono cable:	39.5 mΩ/m
Capacitance of phono cable:	41.5 pF/m
Diameter of arm base mounting hole:	∅62 mm

Arm unit EPA-A501H (Patent pending)

Type:	Interchangeable arm unit Dynamic damping system
Arm pipe:	Titanium-nitride (TiN) tapered pipe
Effective length:	250 mm
Rear stub length:	Min. 68 mm to max. 85.5 mm (from the tonearm fulcrum).
Overhang:	15 mm
Lateral tracking error:	+1°6′ at the inner groove, 30 cm record +2°6′ at the outer groove, 30 cm record
Effective arm mass:	8 g (without cartridge)
Applicable cartridge compliance (dynamic, 100 Hz):	$10 \sim 14 \times 10^{-6}$ cm/dyne
Applicable cartridge weight:	5~7 g
Applicable stylus pressure:	0,75~1,75 g 1,75~2,75 g (with shell weight)
Resonance peak:	Below 6 dB

Stylus pressure gauge SH-50P1 (Patent pending)

Type:	Semiconductor strain gauge electronic stylus pressure gauge, with "0" point adjustment and gain control mechanism
Power source:	DC 3V, Silver oxide battery (SR44 type)×2
Stylus pressure measurement range:	0.5~3 g
Semiconductors used:	Semiconductor strain gauge ... 2 Transistor ..... 2 LED 1
Dimensions:	14.7(W)×5.2(D)×2.4(H) cm
Weight:	125 g

Specifications subject to change without notice.

■ Concerning the Technics System Tonearm

The EPA-500 differs from previous universal tonearm designs in that its arm base and arm units are separated, thus giving it the ability to convert to the suitable arm unit as easily as headshell conversion on ordinary tonearms. Therefore, it is the only tonearm system which can claim to obtain the ideal characteristics from cartridges of different masses or compliances.

Technics has researched the problem of cartridge/tonearm matching and developed the world's first variable dynamic damping system, used in its EPA-100, which, by matching the damping characteristics to the compliance and mass characteristics of the cartridge, succeeded in greatly lowering the low-frequency resonance peak of the cartridge/tonearm assembly.

The EPA-500 has further expanded the EPA-100's concept so that you will now be able to obtain optimum performance from your cartridge by selecting a tonearm with the most suitable effective mass, arm resonance and damping characteristics. Further, the EPA-500 system includes in addition to the arm base (EPA-B500) and arm unit (EPA-A501H), an electronic stylus pressure gauge (SH-50P1) as standard, which utilizes a highly precision semiconductor strain gauge.

Since the line up of optional arm unit models are designed to comply with the requirements for nearly all available cartridges, you'll be able to enjoy improved performance with the cartridges of your choice.

Features of the Techincs EPA-500

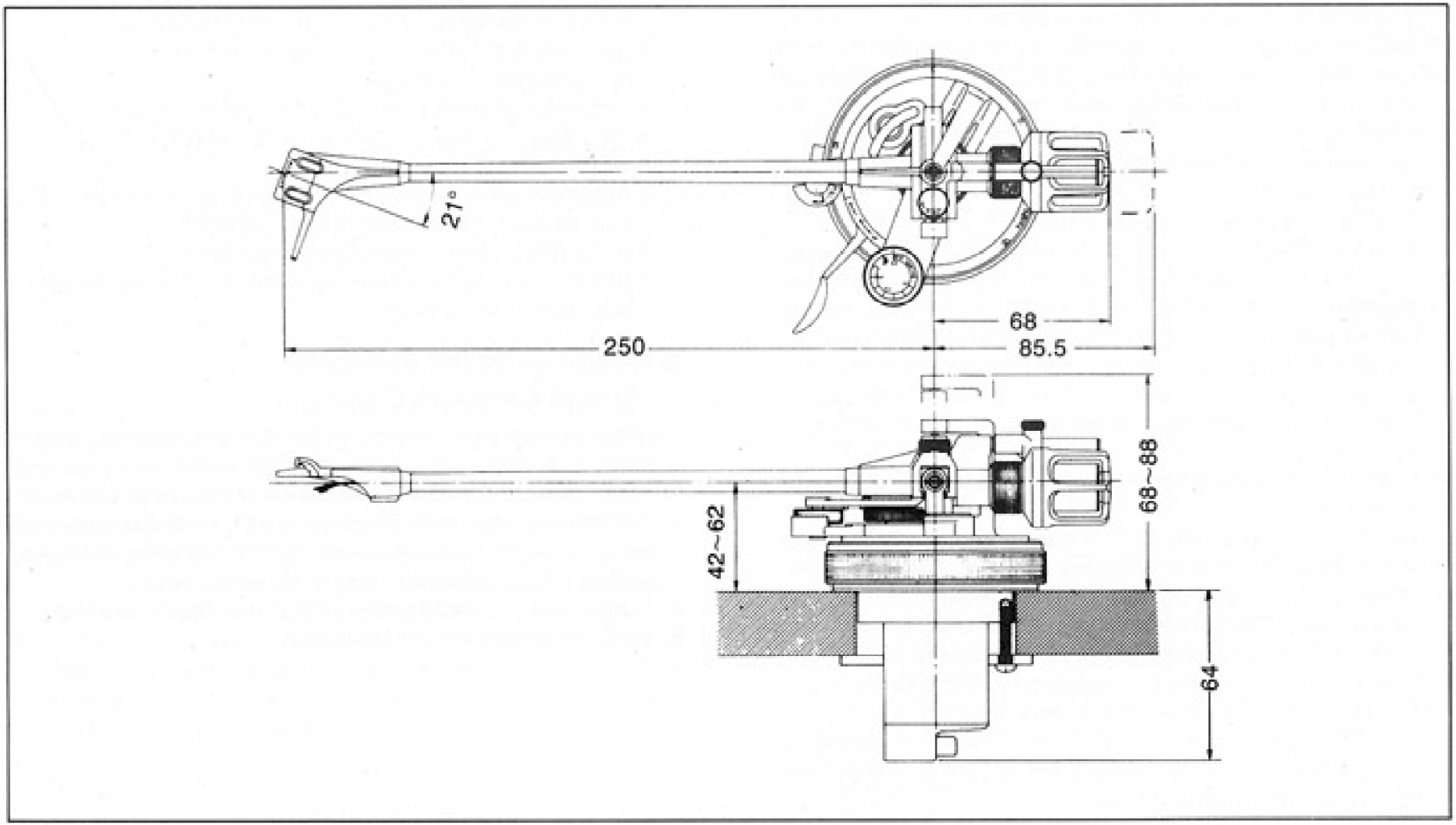
1. **A "system tonearm" that assures close matching of tonearm and different cartridge characteristics by means of an interchangeable arm unit system.**

   The compliance of a cartridge varies according to the type, and the low-range resonance frequency of the cartridge/tonearm changes according to the differences in compliance and mass of the cartridge. The greater the arm's effective mass (heavy weight class), the lower the low-range resonance frequency, and the higher the compliance of a cartridge, the lower this figure becomes. Conversely, the smaller the arm's effective mass or the lower the compliance of the cartridge, the higher this low-range resonance frequency becomes.

   In order to obtain the ideal low-range frequency response from the cartridge and tonearm in use, a resonance frequency too low or too high must be avoided. If too low, the record's warp frequency (below 7 Hz) is mechanically amplified, which might result in distortion or skipping of the stylus. Or, if too high, the resonance will have an adverse effect within the audible frequency range (above 20 Hz). Thus, too high and too low must both be avoided. From this, we know that a low-range resonance frequency of around 10 Hz is desirable.

   With the EPA-500, the tonearm unit having the most ideal matching characteristics with the compliance and mass of the cartridge in use can be selected, and changed whenever required. The EPA-500 has been developed based on the computer-assisted vibration analysis, and its design concept is a total suppression of both external and internal vibrations.

■ Dimensional diagram (unit: mm)



Panasonic Company
Division of Matsushita Electric
Corporation of America
One Panasonic Way, Secaucus,
New Jersey 07094

Panasonic Hawaii, Inc.
320 Waiakamilo Road, Honolulu,
Hawaii 96817

Arm Unit/Cartridge Matching List

Model No. of Arm Unit	Applicable Cartridge			
	Weight	Compliance	Manufacturer	Model No.
★EPA-A501H EPA-A502H EPA-A503H	5-7 (g)	10-14 ($\times 10^{-6}$ cm/dyne 100Hz)	**Technics**	**EPC-305MC**
			GRACE	F-8C, F-9D, F-9U, F-9F
			ORTOFON	F15MKⅡ, MC-20
			SHURE	V15 Type Ⅲ*, V15 Type Ⅳ*, M95ED*, M91ED*
			STANTON	680EE*, 681EE*, 881S*
★EPA-A501M EPA-A502M EPA-A503M	5-7	7-10	**Technics**	**EPC-300MC**
			AUDIO TECHNICA	AT-14Sa
			GRACE	F-8L, F-9L
			ORTOFON	FF-15MKⅡ
★EPA-A501L	5-7	5-7	AUDIO TECHNICA	AT-10, AT-11
			ORTOFON	MC-10
★EPA-A501E	5-6.5	14-25	ADC	ZLM, QLM, XLM/Ⅲ, QLM36/Ⅱ
			ORTOFON	M20E Super
★EPA-A501G	7-11	6-10	AUDIO TECHNICA	AT-15XE, AT-15SS
			DENON	DL-103,DL-103S,DL-103T,DL-103D
			JVC	MC-1
			SATIN	M117G

Note: 1) Those arm units with a star (★) will be available.

2) Weight and compliance data of those cartridges with an asterisk (*) were obtained from our own measurement.

3) Some of the cartridges listed above may not fit well due to their unsuitable shape and dimensions.

4) This lists only some of the measured cartridge manufacturers and their models.

SFPDS50009
F0579D0

Printed in Japan